

REMARKS

Reconsideration of this application is respectfully requested. Claim 1 has been amended to more fully comply with the requirements of 35 U.S.C. § 112, second paragraph. No new matter has been added. Claims 1-18 remain in the application.

Rejection Under 35 U.S.C. § 112, Second Paragraph

Claim 1 has been rejected as indefinite for failing to provide antecedent basis for the phrase "said aqueous medium". Claim 1 has been amended to recite "an aqueous medium", thereby removing the issue of antecedent basis. The claim now conforms to the requirements of § 112, second paragraph, and the rejection on this ground should be withdrawn.

Rejections Under 35 U.S.C. § 103

Claims 1-6, 9-13 and 16 stand rejected under 35 U.S.C. § 103(a) as obvious in light of United States Patent No. 5,662,940 to Hight et al ("Hight"). Applicants traverse this rejection.

Hight describes a method of adding a hypochlorite donor and a bromide ion donor to an aqueous medium to control biofouling and microorganism population levels in recirculating water systems. While Hight describes chlorinated hydantoins as possible hypochlorite donors, Hight does not teach or suggest dissolving an existing biofilm with one or more chlorinated hydantoins in the absence of a bromide ion donor. Indeed, Hight teaches away from the use of hydantoin products because of their low dissolution rates and the inhibition of activity resulting from hydantoin byproducts. Furthermore, while Hight might describe methods for maintaining bromide ion concentration, it does not teach or suggest a method for maintaining the claimed concentrations of said chlorinated hydantoins in an aqueous medium.

Furthermore, Hight requires the presence of bromide ions (which would be oxidized by hypochlorite to form hypobromous acid) while a hydantoin (which may be unsubstituted, halogenated or alkylated) may optionally be present as "a bromine volatilization suppressant" (see

claim 3 of Hight). However, the specification of Hight (in particular, column 5, lines 34-64) explicitly teaches away from using halogenated hydantoin because of their alleged disadvantages. This is inconsistent with some of Hight's claims, but confirmed for 1-bromo-3-chloro-5,5-dimethylhydantoin (BCDMH) by its Examples 1, 2 and 12 (see Tables 1 and 2). The present invention, on the other hand, requires chlorinated hydantoin in an amount sufficient to form a concentration of from about 0.01 to 100 ppm (expressed as Cl₂) of such chlorinated hydantoin in said aqueous medium, and not bromine (neither bromide ions nor elemental bromine or hypobromous acid) and the present application clearly demonstrates that chlorinated hydantoin have unique properties in biofilm removal and are superior to brominated hydantoin (see Tables 1 and 3).

Finally, the Examiner contends that "the control of the microbial deposits or biofouling in Hight et al. would appear to include the disintegration of biofilm and bulked biologically active sludge". However, this is simply speculation. Removal and disintegration of biofilm and bulked biologically active sludge is a much more demanding job than that just controlling – i.e., preventing or inhibiting – the *formation* of biofilm and biologically active sludge. Hight does not teach or suggest that its compositions and methods are able to remove or *disintegrate* existing biofilm etc. Instead Hight is directed to the "control" of such biofilm and the Examples of Hight appear to address only suspended microorganisms. See Table 3 of the present application which provides observations comparing the ability of various compounds to "control" or "remove" biofilms. As is clear from this Table, several compounds (including each of the bromine compounds listed) are able to "control" biofilm, but are unable to "remove" such biofilms.

Claims 7, 8, 14, 15, 17 and 18 stand rejected under 35 U.S.C. § 103(a) as obvious in light of Hight in view of United States Patent No. 5,565,109 to Sweeny ("Sweeny"). Sweeny describes a method of enhancing the efficacy of free halogen-generating slimicides including halogenated hydantoin. The Examiner contends that Sweeny discloses that the *in situ* formation of biocides is known in the art to enhance their bactericidal efficacy. This ground of rejection is also traversed.

This ground of rejection amounts to application of the improper obvious to try standard for obviousness. There would have been no expectation in the art that one would be able to produce chlorinated hydantoin in the claimed concentrations in the presence of the required bromide ion donor of Hight. In addition, there is no teaching or suggestion in either of the cited references, taken separately or together, to omit an essential feature of one reference (a bromine ion donor) while keeping a merely optional feature (halogenated hydantoins) which is explicitly stated to be disadvantageous in the reference as noted above, and then combine the teachings of another reference (Sweeny) to reconstruct something similar to the present claimed invention.

For the foregoing reasons, applicants submit that the present claims are patentable over the cited art, and the obviousness rejections of the claims under Section 103 should be withdrawn.

In view of the above amendment, applicant believes the pending application is in condition for allowance.

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Respectfully submitted,

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